

What is claimed is:

530  
A27 1. A method of recognizing at least one object in a digitized representation of an image, comprising:

receiving the digitized representation of the image, the representation having a first resolution;

5 creating a reduced-resolution version of the image responsive to the digitized representation of the image, the reduced-resolution version of the image having a second resolution lower than the first resolution; and

10 identifying a value of each of at least one recognition initial condition responsive to at least a portion of the reduced resolution version of the image; and

15 recognizing the at least one object represented in the digitized representation of the image responsive to the value of each of the at least one recognition initial condition identified.

2. The method of claim 1 wherein the identifying step comprises:

providing a plurality of sets of values of at least one initial condition; A

5 for each of the sets of at least one initial condition, identifying a confidence level of recognition by

attempting to recognize from the reduced-resolution version of the image the at least one object responsive to the at least one initial condition in the set; and

10 selecting at least one of the values of the at least one initial conditions in the set responsive to the confidence levels identified.

52p  
A2 ) 3. The method of claim 2 wherein the selecting step comprises selecting a value of each of at least one initial condition corresponding to a highest confidence level from a plurality of the confidence levels identified.

4. The method of claim 2 wherein the selecting step comprises selecting a value of each of at least one initial condition corresponding to a confidence level exceeding a threshold.

5. The method of claim 1 wherein the creating step comprises calculating an average of at least one value of a plurality of pixels of the digitized representation of the image.

6. The method of claim 1 additionally comprising recognizing at least one additional object represented in the digitized representation of the image responsive to the value of at least one recognition initial condition

5 identified responsive to a confidence level exceeding a threshold.

7. The method of claim 1 additionally comprising:

attempting to recognize at least one additional object represented in the digitized representation of the image responsive to the value of at least one recognition initial  
5 condition identified, the attempting step comprising producing a confidence level of the attempt; and

responsive to the confidence level of the attempt below a threshold:

repeating the identifying step; and

10 recognizing the at least one object represented in the digitized representation of the image responsive to the value of each of the at least one recognition initial condition identified during the repeating step.

8. A computer program product comprising a computer useable medium having computer readable program code embodied therein for recognizing at least one object in a digitized representation of an image, the computer program  
5 product comprising:

computer readable program code devices configured to cause a computer to receive the digitized representation of the image, the representation having a first resolution;

computer readable program code devices configured to  
10 cause a computer to create a reduced-resolution version of the image responsive to the digitized representation of the image, the reduced-resolution version of the image having a second resolution lower than the first resolution; and

computer readable program code devices configured to  
15 cause a computer to identify a value of each of at least one recognition initial condition responsive to at least a portion of the reduced resolution version of the image; and

computer readable program code devices configured to  
20 cause a computer to recognize the at least one object represented in the digitized representation of the image responsive to the value of each of the at least one recognition initial condition identified.

9 The computer program product of claim 8 wherein the computer readable program code devices configured to cause a computer to identify comprises:

computer readable program code devices configured to  
5 cause a computer to provide a plurality of sets of values of at least one initial condition;

computer readable program code devices configured to cause a computer to, for each of the sets of at least one initial condition, identify a confidence level of

10 recognition by attempting to recognize from the reduced-resolution version of the image the at least one object responsive to the at least one initial condition in the set; and

select at least one of the values of the at least one  
15 initial conditions in the set responsive to the confidence levels identified.

003334-20303260  
10. The computer program product of claim 9 wherein the computer readable program code devices configured to cause a computer to select comprise computer readable program code devices configured to cause a computer to  
5 select a value of each of at least one initial condition corresponding to a highest confidence level from a plurality of the confidence levels identified.

11. The computer program product of claim 9 wherein the computer readable program code devices configured to cause a computer to select comprise computer readable program code devices configured to cause a computer to  
5 select a value of each of at least one initial condition corresponding to a confidence level exceeding a threshold.

12. The computer program product of claim 8 wherein the computer readable program code devices configured to cause a computer to creating comprise computer readable program code devices configured to cause a computer to  
5 calculate an average of at least one value of a plurality of pixels of the digitized representation of the image.

13. The computer program product of claim 8 additionally comprising computer readable program code devices configured to cause a computer to recognize at least one additional object represented in the digitized  
5 representation of the image responsive to the value of at least one recognition initial condition identified responsive to a confidence level exceeding a threshold.

14. The computer program product of claim 8 additionally comprising:

computer readable program code devices configured to cause a computer to attempt to recognize at least one  
5 additional object represented in the digitized representation of the image responsive to the value of at least one recognition initial condition identified, the computer readable program code devices configured to cause a computer to attempt comprising computer readable program

10 code devices configured to cause a computer to produce a confidence level of the attempt; and

computer readable program code devices configured to cause a computer to, responsive to the confidence level of the attempt below a threshold:

15 repeat the identifying step; and

recognize the at least one object represented in the digitized representation of the image responsive to the value of each of the at least one recognition initial condition identified during operation of the computer readable program code devices configured to cause a computer to repeat.

15. A system for recognizing objects, the system comprising:

a downsampler having an input coupled to a system input operatively coupled for receiving a representation of an image having a first resolution, the downsampler for producing and providing at an output a reduced-resolution version of the image responsive to the representation of the image received at the downsampler input, the reduced resolution version of the image having a second resolution lower than the first resolution; and

09:06:43.000  
a recognition engine having a first input coupled to  
the downsampler output for receiving the reduced-resolution  
version of the image and a second input coupled to the  
system input for receiving the representation of the image,  
15 the recognition engine for:

at least attempting to recognize at least one first  
object in the reduced resolution version of the image  
received at the first input, at least one time;

recognizing at least one second object in the  
20 representation of the image received at the second input;  
and.

providing a representation of the at least one object  
recognized at a first output coupled to a system output.

16. The system of claim 15 wherein:

the system additionally comprises a initial condition  
selector for selecting and providing at an output a  
plurality of sets of initial conditions, each set different  
5 from at last one of the other sets; and

the recognition engine additionally has a third input  
coupled to the initial condition selector output for  
receiving the plurality of sets of initial conditions and  
the recognition engine performs the attempt on the at least



10 one object at least one time for each of the sets of  
initial conditions received at the third recognition input.

17. The system of claim 16:

wherein the recognition engine:

additionally has a fourth input for receiving an  
additional set of initial conditions;

5 performs the recognizing responsive to the  
additional set of initial conditions;

is additionally for providing a recognition  
confidence level at a second output responsive to said  
attempt, for each of the at least one times; and

10 the system additionally comprising a initial condition  
identifier having a first input coupled to the recognition  
second output for receiving the recognition confidence  
level for each of the at least one times, and a second  
input coupled to the initial condition selector output for  
15 receiving each of the sets of initial conditions, the  
initial condition identifier for selecting and providing at  
an output coupled to the fourth recognition engine input  
the additional set of initial conditions responsive to the  
sets of initial conditions received at the initial  
20 condition identifier second input and the recognition

confidence level for each of the at least one times  
received at the initial condition identifier first input.

18. The system of claim 17 wherein the initial  
condition identifier selects the additional set of initial  
conditions additionally responsive to a threshold  
confidence level.

19. The system of claim 17 wherein:

the at least one time comprises a plurality of times;

and

the initial condition identifier selects the  
additional set of initial conditions responsive to a  
confidence level for at least one of the at least one times  
relative to at least one other confidence level for at  
least a different of the at least one times.

20. The system of claim 20 wherein the recognition  
engine additionally recognizes at least one third object in  
the representation of the image received at the second  
input responsive to the additional set of initial  
5 conditions and a confidence level corresponding to the at  
least one third object.

Add  
027